



Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-516



SSN 774 Virginia Class Submarine (SSN 774)

As of FY 2017 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance
ACAT - Acquisition Category
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
\$B - Billions of Dollars
BA - Budget Authority/Budget Activity
Blk - Block
BY - Base Year
CAPE - Cost Assessment and Program Evaluation
CARD - Cost Analysis Requirements Description
CDD - Capability Development Document
CLIN - Contract Line Item Number
CPD - Capability Production Document
CY - Calendar Year
DAB - Defense Acquisition Board
DAE - Defense Acquisition Executive
DAMIR - Defense Acquisition Management Information Retrieval
DoD - Department of Defense
DSN - Defense Switched Network
EMD - Engineering and Manufacturing Development
EVM - Earned Value Management
FOC - Full Operational Capability
FMS - Foreign Military Sales
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
IOC - Initial Operational Capability
Inc - Increment
JROC - Joint Requirements Oversight Council
\$K - Thousands of Dollars
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
\$M - Millions of Dollars
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
O&S - Operating and Support
PAUC - Program Acquisition Unit Cost

PB - President's Budget
PE - Program Element
PEO - Program Executive Officer
PM - Program Manager
POE - Program Office Estimate
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
SCP - Service Cost Position
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting
U.S. - United States
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

Program Information

Program Name

SSN 774 Virginia Class Submarine (SSN 774)

DoD Component

Navy

Responsible Office

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References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated September 3, 2010

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated September 3, 2010

Mission and Description

The VIRGINIA Class (SSN 774) Submarine Program is bringing forward a critical national security asset designed to flexibly address the unique multi-mission requirements of the post-Cold War era. Capable of performing traditional submarine missions, dominating the littoral battle space and adapting to future requirements, the VIRGINIA Class Submarine satisfies any assigned role well into the Twenty-First Century. Intended to replace the fleet of SSN 688 Class submarines, the VIRGINIA Class Submarine is characterized by state-of-the-art stealth, enhanced features for special operations forces, and cost effective Command, Control, Communication and Intelligence capability. With an array of armament including the MK48 Advanced Capability torpedo and cruise missile vertical launch capability, the VIRGINIA Class Submarine maintains total undersea superiority at an affordable cost.

Executive Summary

Program Highlights Since Last Report:

The VIRGINIA Class Submarine Program continues to deliver submarines within cost, ahead of schedule, with improved quality and with increasing performance capabilities more than eleven years after lead ship delivery in October 2004. With the delivery to the Navy of USS JOHN WARNER (SSN 785) in June 2015, 12 VIRGINIAs are in service today.

The program is restructuring to increase the number of submarines in the class from 30 to 48. A Component Cost Position is being developed to support an update to the APB, which, in addition to VIRGINIA Payload Module (VPM) will also include Acoustic Superiority (AS) on Block V and follow-on ships.

The VPM design is progressing on schedule. An initial Integrated Master Schedule (IMS) was submitted in December 2014 with an IMS for final module configuration submitted in December 2015. VPM prototyping is underway for an FY 2019 construction start which is supported by Detailed Design and contractor furnished equipment long lead time material in the President's Budget for 2017 (PB17). SOUTH DAKOTA Insertion Program (SDIP) is a near-term AS concept demonstration on a VIRGINIA Class platform to be installed during SOUTH DAKOTA (SSN 790) Post Shakedown Availability. PB17 includes RDT&E funding for SDIP and AS for Block V.

Recent milestones in the construction and testing of VIRGINIA Class Submarines are highlighted by the Commissioning of USS JOHN WARNER (SSN 785) at Norfolk Naval Shipyard on August 1, 2015 and the Christening of ILLINOIS (SSN 786) on October 10, 2015 by the First Lady, Michelle Obama, the ship's sponsor. WASHINGTON (SSN 787) achieved a significant production milestone with the completion of her pressure hull on August 29, 2015.

Other near term VIRGINIA Class program events include Pre-Commissioning Unit (PCU) COLORADO (SSN 788) completion of her Pressure Hull in February 2016. PCU ILLINOIS (SSN 786) is projected to deliver in May 2016, marking a 62 month construction span. PCU WASHINGTON (SSN 787) is projected to deliver in September 2016 with a 60.5 month production period.

There are no significant software-related issues with this program at this time.

History of Significant Developments Since Program Initiation:

August 1992: Milestone 0 for Centurion Submarine, "the first submarine designed with affordability considerations paramount". Conceptualized as a lower cost alternative to SEAWOLF Class.

August 1994: Milestone I was approved for the New Attack Submarine (NSSN) following two years of extensive review of requirements and rigorous systems definition effort.

December 1994: Milestone I APB established.

June 30, 1995: The New Attack Submarine Program successfully passed Milestone II with the signing of an ADM.

June 1995: A waiver from full-up, system-level live fire testing was approved jointly by USD(A&T) and Director, Operational Test & Evaluation with notification letters sent to Congressional Defense Committees on June 29, 1995.

April 24, 1996: Contract award for the NSSN Command, Control, Communications and Intelligence (C3I) System was executed to Lockheed Martin Federal Systems.

May 9, 1996: The Integrated Process and Product Development 1996 Design/Build Contract with Electric Boat (EB) Corporation was definitized.

October 27, 1997: The revised APB (Change 1 to the Development Baseline of June 30, 1995) was signed to reflect the co-

construction teaming arrangement between EB) and Newport News Shipbuilding (NNS) as mandated in the FY98 Authorization and Appropriations Acts.

September 30, 1998: The IPPD 96 Design Build contract with EB was modified to include construction of the first four VIRGINIA Class Submarines.

January 2001: Systems testing and integration started on the first Command and Control Systems Module (CCSM) at the Off-hull Assembly and Test Site (COATS). The COATS facility is used to test VIRGINIA Class CCSM units prior to shipyard delivery.

August 2003: The Navy awarded the Block II construction contract with clauses to transition to a multi-year contract in FY2004 in pursuit of the lowest possible future program costs.

January 2004: The transition to multi-year procurement for hulls six through ten was completed in January 2004 following approval by Congress in the FY04 Defense Appropriations and Authorization Acts.

October 12, 2004: Lead Ship delivery (USS VIRGINIA SSN 774). Delivery occurred within the original baseline schedule threshold set ten years earlier, in 1994.

June 20, 2006: USS TEXAS, which was essentially the second lead ship of the class, is the first submarine delivered at Northrop Grumman, Newport News in nearly ten years.

March 5, 2007: The program achieves IOC although USS VIRGINIA first deployed operationally in the fall of 2005 in support of the Global War on Terror.

December 2008: The Navy awards the Block III construction contract to General Dynamics Electric Boat (and Northrop Grumman Newport News) for the construction of eight VIRGINIA Class submarines from FY 2009 through FY 2013.

September 2010: The program achieves Milestone III. The ADM was signed by USD(AT&L) and included a declaration of Full Operational Capability and authorization of Full Rate Production.

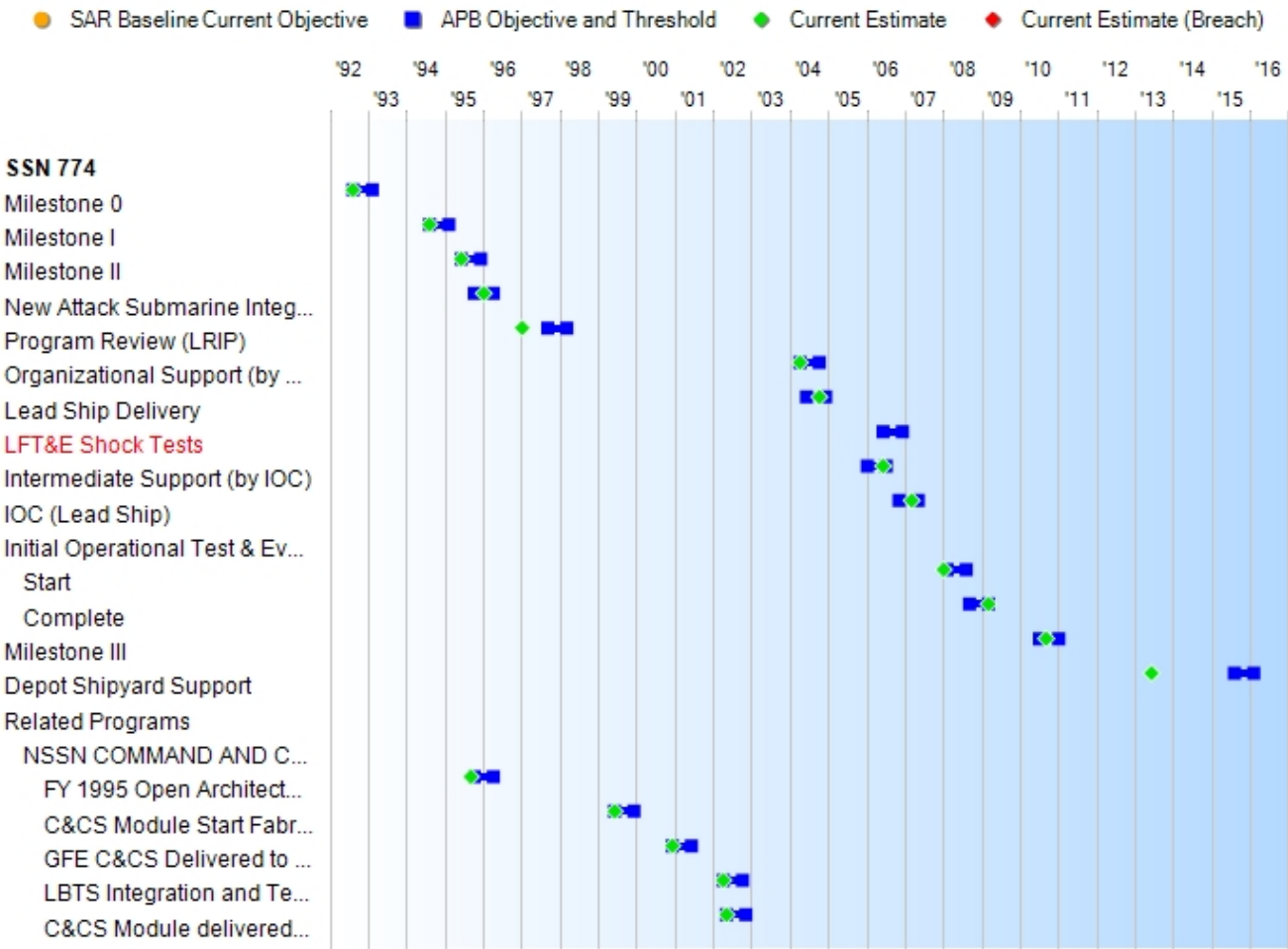
October 2010: The program accelerates to Full Rate Production of two ships per year.

April 2014: The Navy, with General Dynamics Electric Boat and Huntington Ingalls Industries-Newport News, signed a Block IV Construction Contract to build ten VIRGINIA Class Submarines. Under the five-year agreement, Electric Boat and Newport News Shipbuilding will jointly build two ships per year from FY 2014 - FY 2018.

Threshold Breaches

APB Breaches			Explanation of Breach
Schedule		<input checked="" type="checkbox"/>	Schedule -- This schedule breach was previously reported in the December 2006 SAR.
Performance		<input type="checkbox"/>	
Cost	RDT&E	<input type="checkbox"/>	Nunn McCurdy Unit Cost -- This program reflects a significant Nunn-McCurdy breach to the original baseline that was first reported in the December 2005 SAR.
	Procurement	<input type="checkbox"/>	
	MILCON	<input type="checkbox"/>	
	Acq O&M	<input type="checkbox"/>	
O&S Cost		<input type="checkbox"/>	
Unit Cost	PAUC	<input type="checkbox"/>	
	APUC	<input type="checkbox"/>	
Nunn-McCurdy Breaches			
Current UCR Baseline			
	PAUC	None	
	APUC	None	
Original UCR Baseline			
	PAUC	Significant	
	APUC	Significant	

Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Milestone 0	Aug 1992	Aug 1992	Feb 1993	Aug 1992
Milestone I	Aug 1994	Aug 1994	Feb 1995	Aug 1994
Milestone II	Jun 1995	Jun 1995	Dec 1995	Jun 1995
New Attack Submarine Integrated Product and Process Development Contract Award	Oct 1995	Oct 1995	Apr 1996	Jan 1996
Program Review (LRIP)	Sep 1997	Sep 1997	Mar 1998	Jan 1997
Organizational Support (by Fast Cruise)	Apr 2004	Apr 2004	Oct 2004	Apr 2004
Lead Ship Delivery	Jun 2004	Jun 2004	Dec 2004	Oct 2004
LFT&E Shock Tests	Jun 2006	Jun 2006	Dec 2006	N/A ¹
Intermediate Support (by IOC)	Jan 2006	Jan 2006	Jul 2006	Jun 2006
IOC (Lead Ship)	Nov 2006	Nov 2006	May 2007	Mar 2007
Initial Operational Test & Evaluation				
Start	Feb 2008	Feb 2008	Aug 2008	Jan 2008
Complete	Sep 2008	Sep 2008	Mar 2009	Mar 2009
Milestone III	Jul 2010	Jul 2010	Jan 2011	Sep 2010
Depot Shipyard Support	Aug 2015	Aug 2015	Feb 2016	Jun 2013
Related Programs				
NSSN COMMAND AND CONTROL SYSTEM				
FY 1995 Open Architecture Demo Complete	Oct 1995	Oct 1995	Apr 1996	Sep 1995
C&CS Module Start Fabrication	Jun 1999	Jun 1999	Dec 1999	Jun 1999
GFE C&CS Delivered to Shipyard	Dec 2000	Dec 2000	Jun 2001	Dec 2000
LBTS Integration and Test Complete	Apr 2002	Apr 2002	Oct 2002	Apr 2002
C&CS Module delivered to ship	May 2002	May 2002	Nov 2002	May 2002

¹ APB Breach

Classified Schedule information is provided in the classified annex to this submission.

Change Explanations

None

Notes

On December 4, 2006, the USD(AT&L) notified Congress of the decision to eliminate the VIRGINIA Class Ship Shock Test from the Live Fire Test and Evaluation portion of the VIRGINIA Class Test and Evaluation Master Plan.

Acronyms and Abbreviations

C&CS - Command and Control System
GFE - Government Furnished Equipment
LBTS - Land Based Test Site
LFT&E - Live Fire Test and Evaluation
NSSN - New Attack Submarine

Performance

Classified Performance information is provided in the classified annex to this submission.

Track to Budget

RDT&E			
Appn	BA	PE	
Navy	1319	03	0603561N
	Project	Name	
	2177	NEW DESIGN SSN HM&E (NSSN UNIQUE)	(Sunk)
Navy	1319	03	0603564N
	Project	Name	
	2200	Ship Preliminary Design	(Sunk)
Navy	1319	03	0603570N
	Project	Name	
	2158	NUCLEAR PROPULSION	(Sunk)
Navy	1319	05	0604558N
	Project	Name	
	1947	NEW DESIGN SSN HM&E and Combat Systems	
	1950	NEW DESIGN SSN HM&E and Combat Systems	
	2429	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	2430	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	2644	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	2645	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	2887	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	2888	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	3062	NEW DESIGN SSN HM&E and (Shared) Combat Systems	(Sunk)
	4500	VIRGINIA Payload Module	(Sunk)
	Notes:	VIRGINIA Payload Module funding shifted to Program Element 0604580N beginning in FY 2014.	
	9231	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	9232	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	9386	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	9387	NEW DESIGN SSN HM&E and Combat Systems	(Sunk)
	9999	NEW DESIGN SSN HM&E and	(Sunk)

Combat Systems

Navy	1319	04	0604567N	
	Project		Name	
	2199		Ship Contract Design	(Sunk)
Navy	1319	05	0604580N	
	Project		Name	
	4500		VIRGINIA Payload Module	

Notes

FYDP funding includes the following projects from BA 05 PE 0604558: Project F1947 New Design Hull Mechanical & Electrical (HM&E) and Project F1950 New Design Combat Systems. PE 0604558, Project 3062, Multi-mission Team Trainer, is not included as part of the VIRGINIA Class baseline acquisition cost for RDT&E. Project F4500 VIRGINIA Payload Module shifted to PE 0604580 beginning in FY 2014.

Procurement

Appn	BA	PE		
Navy	1611	02	0204281N	
	Line Item		Name	
	2013		New SSN (NSSN-1)	
Navy	1611	05	0204281N	
	Line Item		Name	
	5110		Outfitting and Post Delivery	(Shared)
	5300		Completion of Prior Year Shipbuilding Programs	(Shared) (Sunk)
Navy	1810	01	0204281N	
	Line Item		Name	
	0920		Repair Parts	(Shared) (Sunk)
	0942		VA Class Support Equipment	(Shared)

Notes

VIRGINIA Class program acquisition costs include a portion of the Other Procurement, Navy (OPN) budget Project Line Item 0942. Programs included in VIRGINIA Class acquisition costs are: VA Class Special Operations Forces Support, Test and Evaluation Measuring Equipment, Exterior Communication System Trainer, VIRGINIA Ship Control Operator Trainer and Major Shore Spares. The balance of the OPN budget is captured in program O&S Costs.

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 1995 \$M			BY 1995 \$M	TY \$M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	5420.4	5420.4	5962.4	5602.1	6351.2	6351.2	6610.1
Procurement	58933.2	58933.2	64826.5	60925.2	86856.1	86856.1	97651.4
Flyaway	--	--	--	60416.9	--	--	96863.9
Recurring	--	--	--	58748.7	--	--	94931.6
Non Recurring	--	--	--	1668.2	--	--	1932.3
Support	--	--	--	508.3	--	--	787.5
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	508.3	--	--	787.5
MILCON	0.0	0.0	--	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	64353.6	64353.6	N/A	66527.3	93207.3	93207.3	104261.5

Confidence Level

Confidence Level of cost estimate for current APB: 50%

The Independent Cost Estimate (ICE) to support the VIRGINIA Class Submarine Program Milestone III decision, like all life-cycle cost estimates previously performed by Cost Assessment and Program Evaluation (CAPE), is built upon a product-oriented work breakdown structure, based on historical actual cost information to the maximum extent possible, and, most importantly, based on conservative assumptions that are consistent with actual demonstrated contractor and government performance for a series of acquisition programs in which the Department has been successful.

It is difficult to calculate mathematically the precise confidence levels associated with life-cycle cost estimates prepared for Major Defense Acquisition Programs (MDAPs). Based on the rigor in methods used in building estimates, the strong adherence to the collection and use of historical cost information, and the review of applied assumptions, we project that it is about equally likely that the estimate will prove too low or too high for execution of the program described.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	0	0	0
Procurement	30	30	33
Total	30	30	33

Quantity Notes

The Navy is planning for a class extension and has added Advance Procurement (FY 2018 - FY 2021) and Full Funding (two ships in FY 2020, one ship in FY 2021) accordingly. The Increase in the Current Estimate for cost from PB 2016 to PB 2017 is primarily due to additional funding in FY 2020 and FY 2021 for VIRGINIA Payload Module (VPM) and a class extension.

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2017 President's Budget / December 2015 SAR (TY\$ M)									
Appropriation	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
RDT&E	5355.4	317.2	208.5	220.2	85.6	75.4	85.3	262.5	6610.1
Procurement	62194.7	5424.8	5106.8	5334.3	6894.9	7497.2	4569.9	628.8	97651.4
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2017 Total	67550.1	5742.0	5315.3	5554.5	6980.5	7572.6	4655.2	891.3	104261.5
PB 2016 Total	67605.7	5741.4	5544.1	5422.3	6901.9	7027.0	175.9	894.3	99312.6
Delta	-55.6	0.6	-228.8	132.2	78.6	545.6	4479.3	-3.0	4948.9

Quantity Summary										
FY 2017 President's Budget / December 2015 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	22	2	2	2	2	2	1	0	33
PB 2017 Total	0	22	2	2	2	2	2	1	0	33
PB 2016 Total	0	22	2	2	2	2	2	0	0	32
Delta	0	0	0	0	0	0	0	1	0	1

Cost and Funding

Annual Funding By Appropriation

Annual Funding							
1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1992	--	--	--	--	--	--	22.7
1993	--	--	--	--	--	--	66.3
1994	--	--	--	--	--	--	363.7
1995	--	--	--	--	--	--	453.4
1996	--	--	--	--	--	--	429.0
1997	--	--	--	--	--	--	452.3
1998	--	--	--	--	--	--	382.4
1999	--	--	--	--	--	--	308.4
2000	--	--	--	--	--	--	275.4
2001	--	--	--	--	--	--	237.3
2002	--	--	--	--	--	--	218.8
2003	--	--	--	--	--	--	242.2
2004	--	--	--	--	--	--	155.4
2005	--	--	--	--	--	--	153.1
2006	--	--	--	--	--	--	166.3
2007	--	--	--	--	--	--	191.2
2008	--	--	--	--	--	--	233.5
2009	--	--	--	--	--	--	180.5
2010	--	--	--	--	--	--	172.8
2011	--	--	--	--	--	--	161.5
2012	--	--	--	--	--	--	105.7
2013	--	--	--	--	--	--	78.7
2014	--	--	--	--	--	--	115.4
2015	--	--	--	--	--	--	189.4
2016	--	--	--	--	--	--	317.2
2017	--	--	--	--	--	--	208.5
2018	--	--	--	--	--	--	220.2
2019	--	--	--	--	--	--	85.6
2020	--	--	--	--	--	--	75.4
2021	--	--	--	--	--	--	85.3
2022	--	--	--	--	--	--	41.5
2023	--	--	--	--	--	--	52.7
2024	--	--	--	--	--	--	57.9
2025	--	--	--	--	--	--	64.7
2026	--	--	--	--	--	--	22.8

2027	--	--	--	--	--	--	22.9
Subtotal	--	--	--	--	--	--	6610.1

Annual Funding 1319 RDT&E Research, Development, Test, and Evaluation, Navy								
Fiscal Year	Quantity	BY 1995 \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
1992	--	--	--	--	--	--	--	23.8
1993	--	--	--	--	--	--	--	68.0
1994	--	--	--	--	--	--	--	365.9
1995	--	--	--	--	--	--	--	447.5
1996	--	--	--	--	--	--	--	416.4
1997	--	--	--	--	--	--	--	433.7
1998	--	--	--	--	--	--	--	363.7
1999	--	--	--	--	--	--	--	289.9
2000	--	--	--	--	--	--	--	255.1
2001	--	--	--	--	--	--	--	216.9
2002	--	--	--	--	--	--	--	198.0
2003	--	--	--	--	--	--	--	216.0
2004	--	--	--	--	--	--	--	134.8
2005	--	--	--	--	--	--	--	129.4
2006	--	--	--	--	--	--	--	136.3
2007	--	--	--	--	--	--	--	153.0
2008	--	--	--	--	--	--	--	183.5
2009	--	--	--	--	--	--	--	140.0
2010	--	--	--	--	--	--	--	132.1
2011	--	--	--	--	--	--	--	120.6
2012	--	--	--	--	--	--	--	77.6
2013	--	--	--	--	--	--	--	57.2
2014	--	--	--	--	--	--	--	82.7
2015	--	--	--	--	--	--	--	134.0
2016	--	--	--	--	--	--	--	220.9
2017	--	--	--	--	--	--	--	142.6
2018	--	--	--	--	--	--	--	147.7
2019	--	--	--	--	--	--	--	56.3
2020	--	--	--	--	--	--	--	48.6
2021	--	--	--	--	--	--	--	53.9
2022	--	--	--	--	--	--	--	25.7
2023	--	--	--	--	--	--	--	32.0
2024	--	--	--	--	--	--	--	34.5
2025	--	--	--	--	--	--	--	37.8
2026	--	--	--	--	--	--	--	13.1
2027	--	--	--	--	--	--	--	12.9
Subtotal	--	--	--	--	--	--	--	5602.1

Annual Funding 1611 Procurement Shipbuilding and Conversion, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1996	--	571.0	--	219.3	790.3	--	790.3
1997	--	532.9	--	242.5	775.4	--	775.4
1998	1	1625.0	--	840.9	2465.9	--	2465.9
1999	1	1881.6	--	165.6	2047.2	--	2047.2
2000	--	743.7	--	--	743.7	--	743.7
2001	1	1589.8	--	90.8	1680.6	0.2	1680.8
2002	1	2407.5	--	60.8	2468.3	15.9	2484.2
2003	1	2402.0	--	14.3	2416.3	8.3	2424.6
2004	1	2715.2	--	6.9	2722.1	11.0	2733.1
2005	1	2601.5	--	--	2601.5	4.3	2605.8
2006	1	2563.9	--	--	2563.9	15.1	2579.0
2007	1	2580.8	--	--	2580.8	8.4	2589.2
2008	1	3157.6	--	--	3157.6	19.5	3177.1
2009	1	3652.5	--	--	3652.5	17.9	3670.4
2010	1	4034.3	--	--	4034.3	9.8	4044.1
2011	2	5164.0	--	--	5164.0	18.7	5182.7
2012	2	4735.8	--	--	4735.8	12.3	4748.1
2013	2	4686.1	--	--	4686.1	16.9	4703.0
2014	2	6523.4	--	--	6523.4	26.2	6549.6
2015	2	5913.2	--	--	5913.2	29.4	5942.6
2016	2	5388.2	--	--	5388.2	34.6	5422.8
2017	2	4974.0	--	93.7	5067.7	30.1	5097.8
2018	2	5199.6	--	90.5	5290.1	35.9	5326.0
2019	2	6459.8	267.4	107.0	6834.2	51.2	6885.4
2020	2	5818.5	1626.8	--	7445.3	42.2	7487.5
2021	1	2536.6	1980.4	--	4517.0	43.1	4560.1
2022	--	122.8	--	--	122.8	14.2	137.0
2023	--	123.6	--	--	123.6	11.4	135.0
2024	--	105.2	--	--	105.2	4.7	109.9
2025	--	102.7	--	--	102.7	--	102.7
2026	--	100.8	--	--	100.8	--	100.8
2027	--	43.4	--	--	43.4	--	43.4
Subtotal	33	91057.0	3874.6	1932.3	96863.9	481.3	97345.2

Annual Funding 1611 Procurement Shipbuilding and Conversion, Navy							
Fiscal Year	Quantity	BY 1995 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1996	--	548.1	--	210.6	758.7	--	758.7
1997	--	503.9	--	229.2	733.1	--	733.1
1998	1	1502.6	--	777.6	2280.2	--	2280.2
1999	1	1712.7	--	150.7	1863.4	--	1863.4
2000	--	660.2	--	--	660.2	--	660.2
2001	1	1364.3	--	77.9	1442.2	0.2	1442.4
2002	1	2054.3	--	51.8	2106.1	13.6	2119.7
2003	1	1937.5	--	11.5	1949.0	6.7	1955.7
2004	1	2113.5	--	5.4	2118.9	8.5	2127.4
2005	1	1939.0	--	--	1939.0	3.2	1942.2
2006	1	1845.9	--	--	1845.9	10.9	1856.8
2007	1	1776.4	--	--	1776.4	5.8	1782.2
2008	1	2101.9	--	--	2101.9	13.0	2114.9
2009	1	2358.8	--	--	2358.8	11.5	2370.3
2010	1	2517.0	--	--	2517.0	6.1	2523.1
2011	2	3119.9	--	--	3119.9	11.3	3131.2
2012	2	2798.1	--	--	2798.1	7.3	2805.4
2013	2	2714.4	--	--	2714.4	9.7	2724.1
2014	2	3709.1	--	--	3709.1	14.9	3724.0
2015	2	3304.7	--	--	3304.7	16.4	3321.1
2016	2	2956.9	--	--	2956.9	19.0	2975.9
2017	2	2677.9	--	50.4	2728.3	16.2	2744.5
2018	2	2744.9	--	47.7	2792.6	19.0	2811.6
2019	2	3343.3	138.4	55.4	3537.1	26.5	3563.6
2020	2	2952.3	825.5	--	3777.8	21.4	3799.2
2021	1	1261.9	985.2	--	2247.1	21.4	2268.5
2022	--	59.9	--	--	59.9	6.9	66.8
2023	--	59.1	--	--	59.1	5.4	64.5
2024	--	49.3	--	--	49.3	2.2	51.5
2025	--	47.2	--	--	47.2	--	47.2
2026	--	45.4	--	--	45.4	--	45.4
2027	--	19.2	--	--	19.2	--	19.2
Subtotal	33	56799.6	1949.1	1668.2	60416.9	277.1	60694.0

The Navy is planning for a class extension and has added Advance Procurement (FY 2019 - FY 2021) and Full Funding (2 ships in FY 2020, 1 ship in FY 2021) accordingly. Funding in the Non End Item Recurring Flyaway column is associated with Advance Procurement for ships beyond the FYDP.

Cost Quantity Information		
1611 Procurement Shipbuilding and Conversion, Navy		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 1995 \$M
1996	--	--
1997	--	--
1998	1	2141.8
1999	1	2356.4
2000	--	--
2001	1	1910.7
2002	1	2021.3
2003	1	1824.4
2004	1	1813.2
2005	1	1745.2
2006	1	1771.4
2007	1	1836.1
2008	1	1781.3
2009	1	1899.5
2010	1	1773.0
2011	2	3355.0
2012	2	3155.7
2013	2	3076.6
2014	2	3166.7
2015	2	3033.0
2016	2	3044.2
2017	2	3015.5
2018	2	3023.6
2019	2	3701.2
2020	2	3519.9
2021	1	1833.9
2022	--	--
2023	--	--
2024	--	--
2025	--	--
2026	--	--
2027	--	--
Subtotal	33	56799.6

Annual Funding 1810 Procurement Other Procurement, Navy								
Fiscal Year	Quantity	TY \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
2005	--	--	--	--	--	--	12.5	12.5
2006	--	--	--	--	--	--	44.1	44.1
2007	--	--	--	--	--	--	47.0	47.0
2008	--	--	--	--	--	--	39.7	39.7
2009	--	--	--	--	--	--	48.0	48.0
2010	--	--	--	--	--	--	13.8	13.8
2011	--	--	--	--	--	--	21.7	21.7
2012	--	--	--	--	--	--	5.3	5.3
2013	--	--	--	--	--	--	1.8	1.8
2014	--	--	--	--	--	--	14.7	14.7
2015	--	--	--	--	--	--	9.3	9.3
2016	--	--	--	--	--	--	2.0	2.0
2017	--	--	--	--	--	--	9.0	9.0
2018	--	--	--	--	--	--	8.3	8.3
2019	--	--	--	--	--	--	9.5	9.5
2020	--	--	--	--	--	--	9.7	9.7
2021	--	--	--	--	--	--	9.8	9.8
Subtotal	--	--	--	--	--	--	306.2	306.2

Annual Funding 1810 Procurement Other Procurement, Navy							
Fiscal Year	Quantity	BY 1995 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2005	--	--	--	--	--	10.4	10.4
2006	--	--	--	--	--	35.6	35.6
2007	--	--	--	--	--	37.2	37.2
2008	--	--	--	--	--	30.9	30.9
2009	--	--	--	--	--	36.9	36.9
2010	--	--	--	--	--	10.4	10.4
2011	--	--	--	--	--	16.1	16.1
2012	--	--	--	--	--	3.9	3.9
2013	--	--	--	--	--	1.3	1.3
2014	--	--	--	--	--	10.5	10.5
2015	--	--	--	--	--	6.5	6.5
2016	--	--	--	--	--	1.4	1.4
2017	--	--	--	--	--	6.1	6.1
2018	--	--	--	--	--	5.5	5.5
2019	--	--	--	--	--	6.2	6.2
2020	--	--	--	--	--	6.2	6.2
2021	--	--	--	--	--	6.1	6.1
Subtotal	--	--	--	--	--	231.2	231.2

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	6/30/1995	6/30/1995
Approved Quantity	14	14
Reference	MS II ADM	MS II ADM
Start Year	1998	1998
End Year	2007	2011

The Current Total LRIP Quantity is more than 10% of the total production quantity due to this being a shipbuilding program for which this is standard practice.

Foreign Military Sales

None

Nuclear Costs

\$17,940.0 (TY\$). These costs are for reactor propulsion plant equipment. These costs are included in the Shipbuilding and Conversion, Navy costs in this report. Department of Energy costs are excluded from this report.

Unit Cost

Unit Cost Report

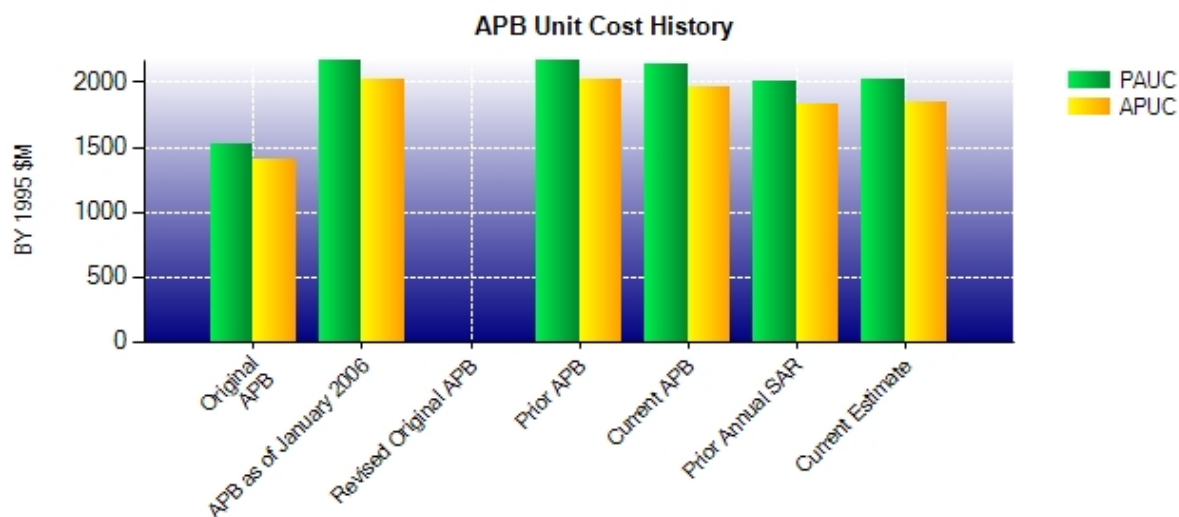
Item	BY 1995 \$M	BY 1995 \$M	% Change
	Current UCR Baseline (Sep 2010 APB)	Current Estimate (Dec 2015 SAR)	
Program Acquisition Unit Cost			
Cost	64353.6	66527.3	
Quantity	30	33	
Unit Cost	2145.120	2015.979	-6.02
Average Procurement Unit Cost			
Cost	58933.2	60925.2	
Quantity	30	33	
Unit Cost	1964.440	1846.218	-6.02

Item	BY 1995 \$M	BY 1995 \$M	% Change
	Original UCR Baseline (Jun 1995 APB)	Current Estimate (Dec 2015 SAR)	
Program Acquisition Unit Cost			
Cost	45633.1	66527.3	
Quantity	30	33	
Unit Cost	1521.103	2015.979	+32.53 ¹
Average Procurement Unit Cost			
Cost	42228.1	60925.2	
Quantity	30	33	
Unit Cost	1407.603	1846.218	+31.16 ¹

¹ Nunn-McCurdy Breach

This program reflects a significant Nunn-McCurdy breach to the original baseline that was first reported in the December 2005 SAR. The supporting breach information and explanations can be found in the UCR section of that SAR.

Unit Cost History



Item	Date	BY 1995 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Jun 1995	1521.103	1407.603	2369.360	2242.227
APB as of January 2006	May 2005	2174.943	2021.430	2749.060	2578.850
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	May 2005	2174.943	2021.430	2749.060	2578.850
Current APB	Sep 2010	2145.120	1964.440	3106.910	2895.203
Prior Annual SAR	Dec 2014	2004.028	1829.784	3103.519	2897.975
Current Estimate	Dec 2015	2015.979	1846.218	3159.439	2959.133

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY \$M)										
Initial PAUC Development Estimate	Changes								PAUC Production Estimate	
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
2369.360	-166.403	0.000	259.820	42.410	564.303	9.333	28.087	737.550	3106.910	

Current SAR Baseline to Current Estimate (TY \$M)										
PAUC Production Estimate	Changes								PAUC Current Estimate	
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
3106.910	174.012	-53.056	-50.218	59.545	-71.127	0.000	-6.627	52.529	3159.439	

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2242.227	-160.064	0.000	259.820	36.360	479.440	9.333	28.087	652.976	2895.203

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2895.203	174.088	-33.810	-50.218	35.364	-54.867	0.000	-6.627	63.930	2959.133

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone I	N/A	Aug 1994	Aug 1994	Aug 1994
Milestone II	N/A	Jun 1995	Jun 1995	Jun 1995
Milestone III	N/A	Oct 2007	Jul 2010	Sep 2010
IOC	N/A	Oct 2005	Nov 2006	Jun 2006
Total Cost (TY \$M)	N/A	71080.8	93207.3	104261.5
Total Quantity	N/A	30	30	33
PAUC	N/A	2369.360	3106.910	3159.439

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	6351.2	86856.1	--	93207.3
Previous Changes				
Economic	+6.1	+5626.2	--	+5632.3
Quantity	--	+4580.0	--	+4580.0
Schedule	--	-1452.6	--	-1452.6
Engineering	+798.0	--	--	+798.0
Estimating	-577.9	-2646.4	--	-3224.3
Other	--	--	--	--
Support	--	-228.1	--	-228.1
Subtotal	+226.2	+5879.1	--	+6105.3
Current Changes				
Economic	-8.6	+118.7	--	+110.1
Quantity	--	+2989.9	--	+2989.9
Schedule	--	-204.6	--	-204.6
Engineering	--	+1167.0	--	+1167.0
Estimating	+41.3	+835.8	--	+877.1
Other	--	--	--	--
Support	--	+9.4	--	+9.4
Subtotal	+32.7	+4916.2	--	+4948.9
Adjustments	--	--	--	--
Total Changes	+258.9	+10795.3	--	+11054.2
CE - Cost Variance	6610.1	97651.4	--	104261.5
CE - Cost & Funding	6610.1	97651.4	--	104261.5

Summary BY 1995 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	5420.4	58933.2	--	64353.6
Previous Changes				
Economic	--	--	--	--
Quantity	--	+2327.8	--	+2327.8
Schedule	--	-747.5	--	-747.5
Engineering	+556.6	--	--	+556.6
Estimating	-401.2	-1809.2	--	-2210.4
Other	--	--	--	--
Support	--	-151.2	--	-151.2
Subtotal	+155.4	-380.1	--	-224.7
Current Changes				
Economic	--	--	--	--
Quantity	--	+1487.4	--	+1487.4
Schedule	--	-101.8	--	-101.8
Engineering	--	+594.8	--	+594.8
Estimating	+26.3	+386.4	--	+412.7
Other	--	--	--	--
Support	--	+5.3	--	+5.3
Subtotal	+26.3	+2372.1	--	+2398.4
Adjustments	--	--	--	--
Total Changes	+181.7	+1992.0	--	+2173.7
CE - Cost Variance	5602.1	60925.2	--	66527.3
CE - Cost & Funding	5602.1	60925.2	--	66527.3

Previous Estimate: December 2014

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-8.6
Congressional adjustment to non-core Research and Development program in FY 2016. (Estimating)	+26.2	+37.5
Revised estimate for VIRGINIA Payload Module (VPM) development program. (Estimating)	-9.6	-13.5
Revised estimate for core Hull, Mechanical and Electrical (HM&E) and Combat Systems RDT&E program. (Estimating)	+7.6	+14.5
Adjustment for current and prior escalation. (Estimating)	+2.1	+2.8
RDT&E Subtotal	+26.3	+32.7

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+118.7
Quantity variance resulting from an increase in the current estimate from 32 to 33 ships. (Subtotal)	+1544.3	+3104.4
Quantity variance resulting from an increase in the current estimate from 32 to 33 ships. (Quantity)	(+1831.5)	(+3681.7)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(-101.8)	(-204.6)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(-185.4)	(-372.7)
Additional Quantity variance associated with the 33rd ship to realign previously funded Advance Procurement. (Quantity)	-344.1	-691.8
Revised estimates for Advance Procurement to fund class restructuring. (Estimating)	+857.4	+1734.0
Additional funding for Acoustic Superiority program in FY 2019 - FY 2021 to incorporate design changes to VIRGINIA Class Submarines. (Engineering)	+316.6	+618.0
Additional funding for the VPM program in FY 2018 - FY 2021 to incorporate the program on Block V and later submarines. (Engineering)	+278.2	+549.0
Revised estimate due to refinement of requirements. (Estimating)	-151.7	-289.1
Revised estimate for Technology Insertion program in FY 2019 - FY 2021. (Estimating)	-69.6	-136.2
Removal of expired funds. (Estimating)	-21.8	-25.6
Adjustment for current and prior escalation. (Estimating)	-42.5	-74.6
Adjustment for current and prior escalation. (Support)	-0.2	0.0
Increase in Initial Spares (Other Procurement Navy). (Support)	+5.8	+9.4
Decrease in Initial Outfitting Spares (Shipbuilding and Conversion, Navy). (Support)	-0.3	0.0
Procurement Subtotal	+2372.1	+4916.2

(QR) Quantity Related

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: SSN 786
Contractor: General Dynamics, EB Corporation
Contractor Location: 75 Eastern Point Road
 Groton, CT 06340
Contract Number: N00024-09-C-2104/3
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 22, 2008
Definitization Date: December 22, 2008

Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1694.1	1825.9	1	1750.7	1888.8	1	1705.4	1707.3

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to authorized contract change orders.

Contract Variance

Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	+1.9	-14.7
Previous Cumulative Variances	+7.0	-11.2
Net Change	-5.1	-3.5
Percent Variance	+0.14%	-1.10%
Percent Complete	+91.46%	

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to final assembly and testing performance leading up to ship delivery in 2016.

The unfavorable net change in the schedule variance is due to attempting to hold an aggressive schedule to deliver ahead of the contract delivery date.

Notes

This contract is more than 90% complete; therefore, this is the final report for this contract.

Contract Identification

Appropriation: Procurement
Contract Name: SSN 787
Contractor: General Dynamics, EB Corporation
Contractor Location: 75 Eastern Point Road
 Groton, CT 06340
Contract Number: N00024-09-C-2104/4
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 22, 2008
Definitization Date: December 22, 2008

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1773.6	1909.2	1	1814.9	1953.7	1	1756.3	1759.1

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to authorized contract change orders.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	+75.3	-69.6
Previous Cumulative Variances	+100.1	-39.9
Net Change	-24.8	-29.7
Percent Variance	+5.66%	-4.97%
Percent Complete	+88.23%	

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to assembly performance moving toward Pressure Hull Complete in August 2015.

The unfavorable net change in the schedule variance is due to working toward an aggressive production schedule. The Contract Performance Report (CPR) baseline is set to the aggressive schedule targets - well before the contractual delivery dates, therefore the schedule variances generated are against the aggressive schedules.

Contract Identification

Appropriation: Procurement
Contract Name: SSN 788
Contractor: General Dynamics, EB Corporation
Contractor Location: 75 Eastern Point Road
 Groton, CT 06340
Contract Number: N00024-09-C-2104/5
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 22, 2008
Definitization Date: December 22, 2008

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1650.0	1777.9	1	1710.4	1844.4	1	1664.6	1672.5

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to authorized contract change orders.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	+33.2	-11.5
Previous Cumulative Variances	+26.5	-19.7
Net Change	+6.7	+8.2
Percent Variance	+2.87%	-0.98%
Percent Complete	+80.77%	

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to positive modular fabrication and assembly performance.

The favorable net change in the schedule variance is due to working towards and meeting aggressive module delivery dates.

Contract Identification

Appropriation: Procurement
Contract Name: SSN 789
Contractor: General Dynamics, EB Corporation
Contractor Location: 75 Eastern Point Road
Groton, CT 06340
Contract Number: N00024-09-C-2104/6
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 22, 2008
Definitization Date: December 22, 2008

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1688.8	1796.5	1	1715.4	1846.6	1	1663.1	1676.1

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to authorized contract change orders.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	+68.5	-54.3
Previous Cumulative Variances	+60.4	-32.7
Net Change	+8.1	-21.6
Percent Variance	+6.26%	-4.73%
Percent Complete	+75.60%	

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to positive labor performance in module fabrication and assembly.

The unfavorable net change in the schedule variance is due to falling short on labor performance in the modular construction process. The Contract Performance Report baseline is set to aggressive schedule targets, well ahead of the contract delivery date. Therefore the schedule variance generated is against the aggressive schedule.

Contract Identification

Appropriation: Procurement
Contract Name: SSN 790
Contractor: General Dynamics, EB Corporation
Contractor Location: 75 Eastern Point Road
 Groton, CT 06340
Contract Number: N00024-09-C-2104/7
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 22, 2008
Definitization Date: December 22, 2008

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1621.3	1738.5	1	1743.6	1879.1	1	1697.4	1699.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to authorized contract change orders.

Contract Variance			
Item	Cost Variance		Schedule Variance
Cumulative Variances To Date (12/31/2015)	+40.8		-32.5
Previous Cumulative Variances	--		--
Net Change	+40.8		-32.5
Percent Variance	+4.26%		-3.28%
Percent Complete	+65.73%		

Cost and Schedule Variance Explanations

The favorable cumulative cost variance is due to positive labor performance on module fabrication and assembly.

The unfavorable cumulative schedule variance is due to falling short on labor performance in the modular construction process.

Notes

This is the first time this contract is being reported.

Contract Identification

Appropriation: Procurement
Contract Name: SSN 791
Contractor: General Dynamics, EB Corporation
Contractor Location: 75 Eastern Point Road
 Groton, CT 06340
Contract Number: N00024-09-C-2104/8
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 22, 2008
Definitization Date: December 22, 2008

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1657.1	1776.9	1	1753.6	1887.1	1	1698.8	1711.7

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to authorized contract change orders.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	+84.2	-25.8
Previous Cumulative Variances	--	--
Net Change	+84.2	-25.8
Percent Variance	+9.39%	-2.80%
Percent Complete	+60.82%	

Cost and Schedule Variance Explanations

The favorable cumulative cost variance is due to positive labor performance on module fabrication and assembly.

The unfavorable cumulative schedule variance is due to falling short on labor performance in the modular construction process.

Notes

This is the first time this contract is being reported.

Contract Identification

Appropriation: RDT&E
Contract Name: Lead Yard Services
Contractor: General Dynamics, EB Corporation
Contractor Location: 75 Eastern Point Road
 Groton, CT 06340
Contract Number: N00024-10-C-2118
Contract Type: Cost Plus Fixed Fee (CPFF)
Award Date: July 02, 2010
Definitization Date: July 02, 2010

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
171.9	N/A	N/A	1044.7	N/A	N/A	1044.7	1044.7

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to tasking added to this incrementally funded contract.

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (CPFF) contract.

Notes

The Lead Yard Services contract provides design studies, engineering, material and logistics support and research and development activities on the baseline VIRGINIA design. Cost and schedule variances are not reported for this contract because this service contract is Level Of Effort for which EVM was not deemed the most effective way to track performance.

This contract is more than 90% complete; therefore, this is the final report for this contract.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	12	12	33	36.36%
Total Program Quantity Delivered	12	12	33	36.36%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	104261.5	Years Appropriated	25
Expended to Date	53475.0	Percent Years Appropriated	69.44%
Percent Expended	51.29%	Appropriated to Date	73292.1
Total Funding Years	36	Percent Appropriated	70.30%

The above data is current as of February 26, 2016.

The 12th ship of the VIRGINIA Class, USS JOHN WARNER (SSN 785), was delivered June 25, 2015.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	June 01, 2010
Source of Estimate:	SCP
Quantity to Sustain:	30
Unit of Measure:	Ship
Service Life per Unit:	33.00 Years
Fiscal Years in Service:	FY 2004 - FY 2058

The source of this data is the VIRGINIA Class Milestone III (MSIII) Program Life Cycle Cost Estimate dated June 2010, which uses the CAPE six element cost classification system. The analysis includes description of input data and detailed Cost Element Structure reporting in the format recommended by the OSD CAPE.

Naval Visibility and Management of Operating and Support Cost (VAMOSOC) data for LOS ANGELES Class and VIRGINIA Class actuals were used to construct the estimate. The estimate includes costs for Unit Level Manpower, Unit Operations, Maintenance, Sustaining Support, Continuing System Improvements, and Indirect Support. Unit Level Manpower was estimated based on the crew description contained in the Manning Estimate Report (15 officers, 120 enlisted), and the direct personnel costs using VIRGINIA Class rates factored for VIRGINIA Class crew size. Unit Operations was based on historical LOS ANGELES Class data and factored by power, weight, and crew size. Maintenance was estimated based on historical LOS ANGELES Class maintenance costs factored for the VIRGINIA Class based on weight. Public and private shipyard data was used, as well as the maintenance schedule provided in the CARD, Rev E dated May 2010, to appropriately phase maintenance costs over the service life of the submarines. Sustaining Support was estimated based on historical LOS ANGELES Class data factored by weight or crew size, depending on the individual element. Continuing System Improvements were estimated based on historical LOS ANGELES Class data factored by weight. The Software Maintenance portion was based on the analysis of DDG 51 cost per line of code and factored by the total Source Lines of Code count contained in the CARD. Indirect Support was based on historical infrastructure costs from U.S. Naval Submarine Bases, as well as historical personnel costs from LOS ANGELES Class which were factored for the VIRGINIA Class crew size.

The difference between the sustainment quantity (30) and the acquisition quantity (33) reflected in other sections of this report is due to a class extension currently being planned by the Navy.

Sustainment Strategy

The baseline sustainment strategy is structured to achieve 14 deployments during the 33 year design life for each of the total force of 30 VIRGINIA Class submarines. The first deployment occurs after a Post Shakedown Availability (PSA) conducted at the private industry construction yard. The deployment rate is achieved through maintaining material readiness using maintenance periods including three Extended Drydocking Selected Restricted Availabilities (EDSRAs) and one Depot Maintenance Period (DMP) scheduled and planned according to the required maintenance periods for major equipments and systems. The EDRSAs and DMP are expected to be performed at Navy depot maintenance facilities such as the Naval shipyards. Additional routine maintenance and repair are conducted throughout the submarine's life cycle at the homeport Navy intermediate maintenance facility.

Changes to the equipment and system design are considered and implemented on a case by case basis which may increase maintenance periodicities and support an increase to 15 deployments during the life cycle for later submarines of the class.

Antecedent Information

Assembly of an accurate compilation O&S cost estimate for the SSN 688 Class using actual cost data going back to 1976 when USS LOS ANGELES was commissioned and then projecting those costs out to Calendar Year 2029 is also problematic based on the availability and detail of the historic data. VIRGINIA Class O&S comparisons with the legacy class are hampered by changes in required attack submarine force size where the LOS ANGELES Class, at one time, had 62 submarines compared to the planned class size of 30 VIRGINIA Class submarines.

The source of antecedent data is VAMOSC data for LOS ANGELES Class submarines for the years 1984-2008, however, this data must be adjusted due to significant differences between the two classes, to achieve a comparable estimate. The LOS ANGELES Class was comprised of 62 ships with major design changes in blocks of ships that had an original planned life of 30 years. Some of these 62 ships were retired at mid-life and, therefore, did not incur normal life of ship maintenance and operating costs.

Annual O&S Costs BY1995 \$M			
Cost Element	SSN 774 Average Annual Cost Per Ship		LOS ANGELES CLASS (Antecedent) Average Annual Cost Per Ship
Unit-Level Manpower	8.980		5.450
Unit Operations	0.740		0.700
Maintenance	13.980		15.030
Sustaining Support	0.960		0.990
Continuing System Improvements	6.370		4.240
Indirect Support	4.370		4.110
Other	0.000		0.000
Total	35.400		30.520

There are several factors contributing to an apparent anomaly between VIRGINIA CLASS and LOS ANGELES Class (SSN 688) per ship Unit Level Manpower costs. The costs for SSN 688 are lower than SSN 774 despite a larger crew size for SSN 688 due to the source and timing of the data. SSN 688 costs are extracted from VAMOSC using class average data 1984 - 2008. Manpower costs for the first several years of the data were approximately 65% of the most recent costs for the SSN 688 Class indicating real growth in pay and allowances (i.e., above inflation) over the period. The overall average, however, is significantly influenced by the lower initial costs. Further, 688 VAMOSC data reflect the average annual cost of ships in the fleet. VIRGINIA estimates were built using a ramp up/ramp down methodology and reflect the total annual manpower costs for the program from assignment of the first pre-commissioning crew of the lead ship through decommissioning of the last ship.

The total O&S Cost referenced below for the SSN 688 Class was derived using the average annual cost per ship, 62 ships in the class and an expected service life of 33 years. The 33-year service life is used for comparative purposes with the SSN 774 Class as SSN 688 ships were originally designed for 30 years and subsequently increased to 33 years. The O&S data will be updated in the next SAR.

Item	Total O&S Cost \$M			
	SSN 774			LOS ANGELES CLASS (Antecedent)
	Current Production APB Objective/Threshold	Current Estimate		
Base Year	36216.6	39838.3	35038.7	62443.9
Then Year	98758.7	N/A	95627.9	N/A

Equation to Translate Annual Cost to Total Cost

The average annual cost per ship is derived by dividing total O&S costs by 30 ships and service life of 33 years.

O&S Cost Variance		
Category	BY 1995 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2014 SAR	35038.7	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	35038.7	

Disposal Estimate Details

Date of Estimate: June 01, 2010
Source of Estimate: SCP
Disposal/Demilitarization Total Cost (BY 1995 \$M): Total costs for disposal of all Ship are 1177.9

Total program disposal costs are estimated to be \$3,130.8M TY.